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NOTES FROM PACIFIC COAST OBSERVATORIES.

The following articles are abstracts of papers delivered at the Stanford Meeting of the Pacific Division of the American Association for the Advancement of Science, April 4-7, 1917.

HYPOTHETICAL PARALLAXES OF 36 STARS. (ABSTRACT)

Recent determinations of the photovisual magnitudes of comparison stars in the globular cluster *Messier 3* permit a statistical discussion of the relative absolute magnitudes of the numerous variables it contains and an application of the results to the short-period Cepheids in the sky at large. A most striking characteristic of these variables is their practical identity in apparent magnitude. Of the 54 stars for which the range and period of variation are satisfactorily determined, the median photographic magnitude on the Harvard scale is 15.70 ± 0.01 , the average deviation for a single star from this mean being less than a tenth of a magnitude. Similarly, in ω *Centauri* the median brightness is 13.57 ± 0.01 , a value which is the same for all three sub-types of short-period variation found in the cluster. Preliminary results show an analogous condition among the variables of *Messier 5* and *Messier 15*, and it is evidently a common property of the variable stars of all such systems. Since the variables considered are real members of the globular clusters, the distances from the earth are sensibly equivalent in each case. There can be little question, therefore, of the essentially exact equality of the absolute luminosity for all variables of this kind. The conclusion may well be that variation of this nature affects stars only at a definite age in their evolutionary history.

We may use the constancy of absolute magnitude to determine the relative parallaxes of all isolated variables of this type, making the reasonable assumption that in our main galactic system the same conditions operate with regard to cluster-type variables as hold in the various globular clusters. These relative parallaxes become absolute and of high accuracy as soon as the intrinsic luminosity of such variables can be determined, the only remaining uncertainty being that of the apparent magnitudes of the isolated variables. A provisional value of the absolute magnitude has been obtained through the aid of proper motions and other data, and in a more extended publication the distances and distribution in space will be given of 36 *Cepheids* with periods less than a day.

With two or three exceptions all are more distant than a thousand light years, and a few are at exceptionally great distances from the plane of the Milky Way.

HARLOW SHAPLEY.

ON THE VARIATIONS IN THE PERIODS OF VARIABLE STARS
IN MESSIER 3. (ABSTRACT)

Several series of plates have been secured with the 60-inch reflector to supplement the work of Professor Bailey on the periods of the variable stars in *Messier* 3. The interval of twenty-one years since the first observations at Harvard affords an opportunity to test for irregularities or secular variations. A number of cases of changing light-elements have been found; and, in fact, with the progress of such work on short period variables it appears likely that long-period fluctuations in the length of the period may be found to be the rule rather than the exception. There is some danger, however, of confusing the more or less transient irregularities in the maxima with the secular perturbations of the mean period.

HARLOW SHAPLEY AND HELEN DAVIS.

FIVE SOUTHERN SPECTROSCOPIC BINARIES AND LIGHT
VARIABLES OF THE δ CEPHEI CLASS. (ABSTRACT)

A very distinctive phenomenon characterizes the class of light variables and spectroscopic binaries of which δ *Cephei* is typical. This characteristic is the approximate coincidence of maximum light with maximum velocity of approach in orbital motion. Eighteen (or more) stars are now known to have this characteristic but all except one are brighter than magnitude 6.3 at maximum. Many of the *Cepheid* variables are in the far southern skies but have not been found to be spectroscopic binaries because too faint to be conveniently observed with the spectroscope. Five, however, have been observed at Santiago, Chile, sufficiently to demonstrate orbital motion and the particular characteristic of the *Cepheid* binaries, as described above. These five are all fainter than magnitude 6.3 at maximum and diminish not more than one magnitude to minimum. They are as follows:

	Variable	Magnitude	Light Period	Spectrum
S	<i>Muscae</i>	6.4-7.3	9.6+ days	F8p
R	<i>Trianguli Australis</i>	6.7-7.4	3.3+	F5 to G5
S	<i>Trianguli Australis</i>	6.4-7.4	6.3+	G5
S	<i>Normae</i>	6.6-7.6	9.7+	G
RV	<i>Scorpii</i>	6.7-7.4	6.0+	F5 to G5